

The Web Time Forgot

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Correction Appended

MONS, Belgium — On a fog-drizzled Monday afternoon, this fading medieval city feels like a forgotten place. Apart from the obligatory Gothic cathedral, there is not much to see here except for a tiny storefront museum called the Mundaneum, tucked down a narrow street in the northeast corner of town. It feels like a fittingly secluded home for the legacy of one of technology's lost pioneers: Paul Otlet.

In 1934, Otlet sketched out plans for a global network of computers (or "electric telescopes," as he called them) that would allow people to search and browse through millions of interlinked documents, images, audio and video files. He described how people would use the devices to send messages to one another, share files and even congregate in online social networks. He called the whole thing a "réseau," which might be translated as "network" — or arguably, "web."

Historians typically trace the origins of the World Wide Web through a lineage of Anglo-American inventors like Vannevar Bush, Doug Engelbart and Ted Nelson. But more than half a century before Tim Berners-Lee released the first Web browser in 1991, Otlet (pronounced ot-LAY) described a networked world where "anyone in his armchair would be able to contemplate the whole of creation."

Although Otlet's proto-Web relied on a patchwork of analog technologies like index cards and telegraph machines, it nonetheless anticipated the hyperlinked structure of today's Web. "This was a Steampunk version of hypertext," said Kevin Kelly, former editor of Wired, who is writing a book about the future of technology.

Otlet's vision hinged on the idea of a networked machine that joined documents using symbolic links. While that notion may seem obvious today, in 1934 it marked a conceptual breakthrough. "The hyperlink is one of the most underappreciated inventions of the last century," Mr. Kelly said. "It will go down with radio in the pantheon of great inventions."

Today, Otlet and his work have been largely forgotten, even in his native Belgium. Although Otlet enjoyed considerable fame during his lifetime, his legacy fell victim to a series of historical misfortunes — not least of which involved the Nazis marching into Belgium and destroying much of his life's work.

But in recent years, a small group of researchers has begun to resurrect Otlet's reputation, republishing some of his writing and raising money to establish the museum and archive in Mons.

As the Mundaneum museum prepares to celebrate its 10th anniversary on Thursday, the curators are planning to release part of the original collection onto the present-day Web. That event will not only be a kind of posthumous vindication for Otlet, but it will also provide an opportunity to re-evaluate his place in Web history. Was the Mundaneum (mun-da-NAY-um) just a historical curiosity — a technological road not taken — or can his vision shed useful light on the Web as we know it?

Although Otlet spent his entire working life in the age before computers, he possessed remarkable foresight into the possibilities of electronic media. Paradoxically, his vision of a paperless future stemmed from a lifelong fascination with printed books.

Otlet, born in 1868, did not set foot in a schoolroom until age 12. His mother died when he was 3; his father was a successful entrepreneur who made a fortune selling trams all over the world. The senior Otlet kept his son out of school, out of a conviction that classrooms stifled children's natural abilities. Left at home with his tutors and with few friends, the young Otlet lived the life of a solitary bookworm.

When he finally entered secondary school, he made straight for the library. "I could lock myself into the library and peruse the catalog, which for me was a miracle," he later wrote. Soon after entering school, Otlet took on the role of school librarian.

In the years that followed, Otlet never really left the library. Though his father pushed him into law school, he soon left the bar to return to his first love, books. In 1895, he met a kindred spirit in the future Nobel Prize winner Henri La Fontaine, who joined him in planning to create a master bibliography of all the world's published knowledge.

Even in 1895, such a project marked an act of colossal intellectual hubris. The two men set out to collect data on every book ever published, along with a vast collection of magazine and journal articles, photographs, posters and all kinds of ephemera — like pamphlets — that libraries typically ignored. Using 3 by 5 index cards (then the state of the art in storage technology), they went on to create a vast paper database with more than 12 million individual entries.

Otlet and LaFontaine eventually persuaded the Belgian government to support their project, proposing to build a "city of knowledge" that would bolster the government's bid to become host of the League of Nations. The government granted them space in a government building, where Otlet expanded the operation. He hired more staff, and established a fee-based research service that allowed anyone in the world to submit a query via mail or telegraph — a kind of analog search engine. Inquiries poured in from all over the world, more than 1,500 a year, on topics as diverse as boomerangs and Bulgarian finance.

As the Mundaneum evolved, it began to choke on the sheer volume of paper. Otlet started sketching ideas for new technologies to manage the information overload. At one point he posited a kind of paper-based computer, rigged with wheels and spokes that would move documents around on the surface of a desk. Eventually, however, Otlet realized the ultimate answer involved scrapping paper altogether.

Since there was no such thing as electronic data storage in the 1920s, Otlet had to invent it. He started writing at length about the possibility of electronic media storage, culminating in a 1934 book, "Monde," where he

laid out his vision of a "mechanical, collective brain" that would house all the world's information, made readily accessible over a global telecommunications network.

Tragically, just as Otlet's vision began to crystallize, the Mundaneum fell on hard times. In 1934, the Belgian government lost interest in the project after losing its bid for the League of Nations headquarters. Otlet moved it to a smaller space, and after financial struggles had to close it to the public.

A handful of staff members kept working on the project, but the dream ended when the Nazis marched through Belgium in 1940. The Germans cleared out the original Mundaneum site to make way for an exhibit of Third Reich art, destroying thousands of boxes filled with index cards. Otlet died in 1944, a broken and soon-to-be-forgotten man.

After Otlet's death, what survived of the original Mundaneum was left to languish in an old anatomy building of the Free University in the Parc Leopold until 1968, when a young graduate student named W. Boyd Rayward picked up the paper trail. Having read some of Otlet's work, he traveled to the abandoned office in Brussels, where he discovered a mausoleumlike room full of books and mounds of paper covered in cobwebs.

Mr. Rayward has since helped lead a resurgence of interest in Otlet's work, a movement that eventually fueled enough interest to prompt development of the Mundaneum museum in Mons.

Today, the new Mundaneum reveals tantalizing glimpses of a Web that might have been. Long rows of catalog drawers hold millions of Otlet's index cards, pointing the way into a back-room archive brimming with books, posters, photos, newspaper clippings and all kinds of other artifacts. A team of full-time archivists have managed to catalog less than 10 percent of the collection.

The archive's sheer sprawl reveals both the possibilities and the limits of Otlet's original vision. Otlet envisioned a team of professional catalogers analyzing every piece of incoming information, a philosophy that runs counter to the bottom-up ethos of the Web.

"I think Otlet would have felt lost with the Internet," said his biographer, Françoise Levie. Even with a small army of professional librarians, the original Mundaneum could never have accommodated the sheer volume of information produced on the Web today.

"I don't think it could have scaled up," Mr. Rayward said. "It couldn't even scale up to meet the demands of the paper-based world he was living in."

Those limitations notwithstanding, Otlet's version of hypertext held a few important advantages over today's Web. For one thing, he saw a smarter kind of hyperlink. Whereas links on the Web today serve as a kind of mute bond between documents, Otlet envisioned links that carried meaning by, for example, annotating if particular documents agreed or disagreed with each other. That facility is notably lacking in the dumb logic of modern hyperlinks.

Otlet also saw the possibilities of social networks, of letting users "participate, applaud, give ovations, sing in the chorus." While he very likely would have been flummoxed by the anything-goes environment of Facebook or MySpace, Otlet saw some of the more productive aspects of social networking — the ability to trade messages, participate in discussions and work together to collect and organize documents.

Some scholars believe Otlet also foresaw something like the Semantic Web, the emerging framework for

subject-centric computing that has been gaining traction among computer scientists like Mr. Berners-Lee. Like the Semantic Web, the Mundaneum aspired not just to draw static links between documents, but also to map out conceptual relationships between facts and ideas. "The Semantic Web is rather Otlet-ish," said Michael Buckland, a professor at the School of Information at the University of California, Berkeley.

Critics of the Semantic Web say it relies too heavily on expert programmers to create ontologies (formalized descriptions of concepts and relationships) that will let computers exchange data with one another more easily. The Semantic Web "may be useful, but it is bound to fail," Dr. Buckland said, adding, "It doesn't scale because nobody will provide enough labor to build it."

The same criticism could have been leveled against the Mundaneum. Just as Otlet's vision required a group of trained catalogers to classify the world's knowledge, so the Semantic Web hinges on an elite class of programmers to formulate descriptions for a potentially vast range of information. For those who advocate such labor-intensive data schemes, the fate of the Mundaneum may offer a cautionary tale.

The curators of today's Mundaneum hope the museum avoids its predecessor's fate. Although the museum has consistently managed to secure financing, it struggles to attract visitors.

"The problem is that no one knows the story of the Mundaneum," said the lead archivist, Stéphanie Manfroid. "People are not necessarily excited to go see an archive. It's like, would you rather go see the latest Star Wars' movie, or would you rather go see a giant card catalog?"

Striving to broaden its appeal, the museum stages regular exhibits of posters, photographs and contemporary art. And while only a trickle of tourists make their way to the little museum in Mons, the town may yet find its way onto the technological history map. Later this year, a new corporate citizen plans to open a data center on the edge of town: Google.

This article has been revised to reflect the following correction:

Correction: June 19, 2008

An article on Tuesday about a museum in Belgium devoted to the Mundaneum, an early concept of a worldwide information and communication network, misstated the year the Nazis marched on Belgium. It was 1940, not 1939.

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